

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Claim 1 (currently amended):

1. A fluid catalytic cracking process comprising:

(a) cracking a crackable hydrocarbon feed by contact with a source of regenerated fluidized cracking catalyst in an enclosed conduit cracking reactor to produce a mixture of cracked hydrocarbon products and spent catalyst containing coke and strippable hydrocarbons and discharging said mixture directly into a closed cyclonic separation means within a vessel;

(b) cyclonically separating said mixture in said separation means into a cracked hydrocarbon product vapor phase with a reduced catalyst content relative to said mixture discharged from said cracking reactor and a spent catalyst phase containing coke and strippable hydrocarbons;

(c) discharging said spent catalyst phase down from said cyclonic separation means into a catalyst stripper within said vessel, said stripper having an upper portion with a stripper cross sectional area, said stripper being in open fluid communication with said vessel and at least a majority of said stripper cross sectional area is open to said vessel;

(d) stripping said spent catalyst in said catalyst stripping means by maintaining spent catalyst as a dense phase fluidized bed fluidized at least in part by injection of stripping steam into a lower portion of said bed to produce:

stripper vapor which is discharged up from said dense phase fluidized bed in said stripping means into said vessel, and

stripped catalyst which is discharged from said stripping means into a catalyst regenerator;

(e) regenerating said stripped catalyst in said catalyst regenerator at catalyst regeneration conditions including contact with an oxygen containing gas and burning coke from said stripped catalyst to produce regenerated catalyst which is recycled to said cracking reactor to crack said feed; and

(f) recovering said stripper vapor discharged up from said dense phase fluidized bed in said stripping means via a snorkel comprising a vertically extending transfer conduit having:

an inlet in said upper portion of said stripper above said dense phase fluidized bed of spent catalyst in said stripper, and

an outlet connective with said cyclonic separation means and wherein said closed cyclonic separation means comprises:

at least one primary cyclone sealingly affixed to said reactor outlet and receiving spent catalyst and cracked products discharged from said riser, discharging spent catalyst down via a primary cyclone dipleg into said stripping means and discharging vapor with a reduced spent catalyst content via a primary cyclone vapor outlet line;

and secondary cyclones further separating spent catalyst from vapor and discharging spent catalyst down via a secondary cyclone dipleg into said stripping means and discharging vapor with a further reduced spent catalyst content via a secondary cyclone vapor outlet directly into a transfer line to a product fractionation means, and

said vertically extending conduit transfers stripper vapor from said stripper to said primary cyclone vapor outlet and wherein at least a portion of said vertically extending transfer conduit is within said primary cyclone dipleg.

Claim 2: (cancelled)

Claim 3: (cancelled)

Claim 4: (cancelled)

Claim 5 (currently amended): The process of claim 4 1 wherein said outlet of said vertically extending transfer conduit is within said primary cyclone.

Claim 6: (cancelled)

Claim 7: (cancelled)

Claim 8: (cancelled)

Claim 9: (cancelled)

Claim 10 (previously presented): A fluid catalytic cracking process comprising:

(a) cracking a crackable hydrocarbon feed by contact with a source of regenerated fluidized cracking catalyst in an enclosed conduit cracking reactor to produce a mixture of cracked hydrocarbon products and spent catalyst containing coke and strippable hydrocarbons and having a temperature above 1000°F and sufficiently high to cause thermal cracking of cracked hydrocarbon products and discharging said mixture from said enclosed conduit directly into a closed cyclone separator system comprising primary and secondary cyclone separators within a vessel;

(b) cyclonically separating said mixture in said primary cyclone separator into:
a cracked product vapor phase comprising at least 90 mole % of said hydrocarbon product vapor discharged from said riser and less than 5 wt % of said spent catalyst discharged from said riser, which is discharged via a primary cyclone vapor outlet connective with an inlet to said secondary cyclone, and

a spent catalyst phase comprising at least 95 wt % of said spent catalyst discharged from said riser and less than 10 mole % of said vapor discharged from said riser, which is discharged down via a primary cyclone dipleg into a catalyst stripper in a lower portion of said vessel;

(c) cyclonically separating said vapor phase discharged from said primary separator in said secondary cyclone separator into:

a cracked hydrocarbon product vapor phase having less than 1 wt % of said spent catalyst discharged from said riser, which is discharged via a secondary cyclone vapor outlet to a line connective with a product fractionator, and

a spent catalyst phase, comprising less than 5 wt % of spent catalyst discharged from said riser and less than 2 mole % of vapor discharged from said riser, which is discharged from a secondary cyclone dipleg into said catalyst stripper;

(d) stripping in said catalyst stripper spent catalyst discharged from said primary and secondary cyclone diplegs in a dense phase fluidized bed fluidized at least in part by injection of stripping steam to a lower portion of said bed to produce:

stripper vapor which is discharged up from said fluidized bed catalyst stripper, and
stripped catalyst that is discharged from said catalyst stripper into a catalyst regenerator;

(e) regenerating stripped catalyst in said catalyst regenerator at catalyst regeneration conditions including contact with an oxygen containing gas to produce regenerated catalyst which is recycled to said cracking reactor; and

(f) transferring from said stripper to said closed cyclones at least a majority of said stripper vapor discharged up from said fluidized bed in said stripper via a snorkel having:

a lower snorkel inlet above said dense phase of fluidized catalyst in said stripper,

an upper snorkel outlet fluidly connected with said cyclone separators, and

a vertical transfer conduit section fluidly isolated from said vessel containing said cyclone separators and physically attached to or within at least one of said primary cyclone diplegs.

Claim 11: (previously presented) The process of claim 10 wherein said vertical transfer conduit of said snorkel is at least partially inside said primary cyclone dipleg.

Claim 12: (previously presented) The process of claim 11 wherein said primary cyclone dipleg is a vertical cylinder having a longitudinal axis, said snorkel transfer conduit is a vertical cylinder having a longitudinal axis and said snorkel transfer conduit is inside and axially aligned with said primary cyclone dipleg.

Claim 13: (previously presented) The process of claim 10 wherein a stripper cap located within said vessel extends horizontally across at least a majority of an upper surface of said stripper.

Claim 14: (withdrawn)

Claim 15: (withdrawn)

Claim 16: (withdrawn)

Claim 17: (withdrawn)